Better Crops

The Pocket Book of Agriculture

VOLUME III NUMBER SIX

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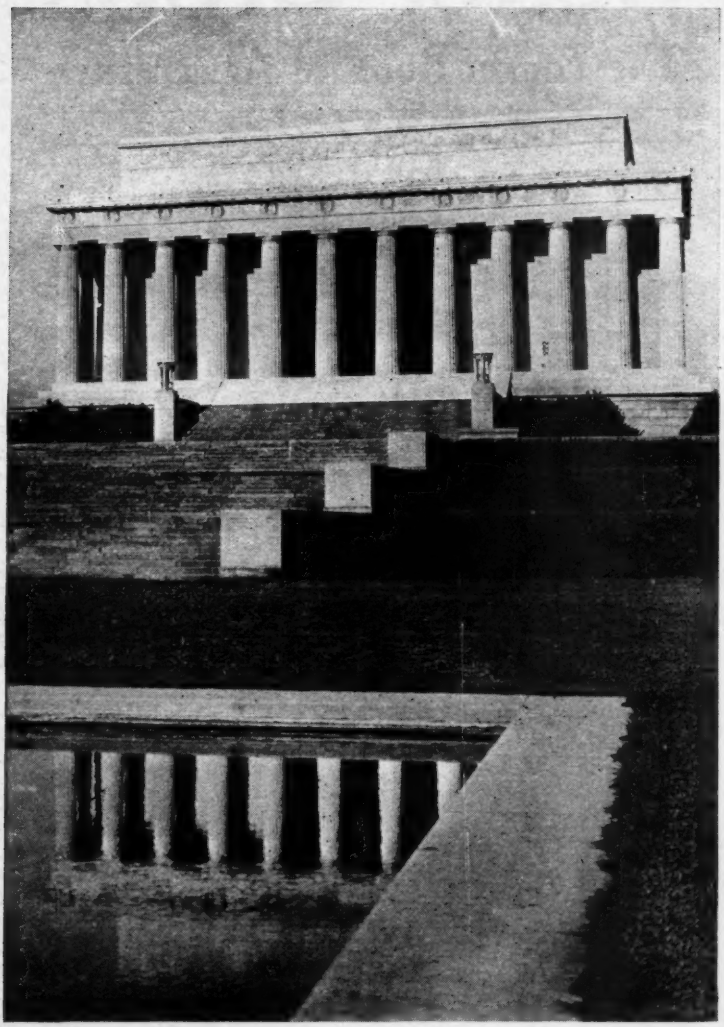

The Lincoln Memorial
at Washington, D. C.

Better Crops

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VOL. III NEW YORK, FEBRUARY, 1925 No. 6

¶In which Jeff tells how we are hopelessly

LINKED *to the* PAST

By Jeff McDermid

A BRINDLE CALF, gender and breed unknown, wandered idly through the woods, nibbling at succulent shoots.

Three hundred busy years have passed!

The woods have been cut down, and the land upon which they stood forms the heart of Boston's downtown section.

The path formed by the aimless calf is now a busy thoroughfare—crooked as an angleworm with the cramps. When I go to Boston without my map and get lost I curse the calf, for I have to ask a policeman where I am and how to get where I am not but where I want to be.

Thus is Boston linked to the past, and are my footsteps led, beyond my will, to follow a winding, crazy street that bewilders and befogs and leaves me to the tender mercies of a Boston Cop.

The calf's path became a road, the road a highway, the highway a street, and the street a main thoroughfare—to change it now would necessitate millions.

I ADMIT in many cases we are incapable of revolting against custom, and that often our whole process of living is so bound to the centuries gone before that each of us is doomed to walk the street marked out by some ancient calf whose master neglected to teach it to walk chalk.

Let us take a simple example. On the outside of each sleeve of a man's coat, at the cuff, are three or four buttons. There are no buttonholes into which these buttons fit. They are the most useless sartorial decoration with which man is afflicted. The tailor wasn't asked to sew them on—he just did it. Ask him why, and he will tell you "We *always* put them on!"

Surely a wise answer!

But here, legend says, is the reason—Napoleon, master warrior-strategist, and ardent and inflexible lover of neatness and orderliness in his men, discovered something one day and quickly put an end to it. He found that his troops were using their sleeves for the purposes usually dedicated to handkerchiefs. He was disgusted. "Sew on three sharp-cut steel buttons on each sleeve—then let 'em wipe," he exclaimed!

So there you are.

The three buttons on your coat prove how hopelessly tailors are linked to the past. That these buttons are there is not important. The slight cost is inconsequential; it aids the poor starving button-makers, so what's the diff!

What we need is someone to yank us out of our accustomed rut which we have worn so deep that our eyes can no longer see over the edge.

BUT let us take another example.

In the early years of the nineteenth century, when George Stephenson conceived the unique idea of a steam buggy that would run on rails, he forged the first link in a chain that binds our railroads to his memory and costs us billions of dollars every year.

His idea was sound, as time has proved. And he did the best he could, which is all any man can do. Peace to his soul.

But when he laid down the first wooden rails, he put them just 56½ inches apart—the width between the wheels of the ordinary wagon—and saddled us with a burden we can now cast off only at the cost of billions of dollars.

Charles Carroll, who broke ground in 1828, for a railroad from Baltimore westward, forged the second link. His rails were 56½ inches apart. "Stephenson had done it, why should we change?"

And so today *all* rails, except the "narrow gauge" short lines are 56½ inches apart. All freight cars, locomotives, Pullmans and passenger cars are built to fit. Tunnels, bridges, round-houses, terminals and signal systems are constructed to accommodate 56½-inch rails.

The chain is forged; and perhaps in the whole system of the world to come no change dare be made. The cost of altering staggers the imagination.

Yet, engineers claim, were the rails 66½ inches apart, twenty-five per cent more freight could be pulled by the same unit of coal, oil or electric fuel. By widening the cars, and thus bringing the load closer to the locomotive, loss due to friction would be greatly

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The County Agent's Family

By E. Bruce Brunson
County Agent, St. Francis, Kansas

¶In the lively discussion that has been going on in BETTER CROPS *on the subject of the county agent's wife, we seem to have overlooked one important angle which Mr. Brunson presents here very forcefully*

IT seems to be human nature for humans (including county agents) to go to extremes. We read of the county agent who works from 4:00 A. M. to 12:00 P. M. We read of the county agent's wife who knows as much as a home demonstration agent and who spends a good deal of time at the phone answering questions on how long to leave the beans in the pressure cooker, etc. We read of the county agent's widow who has to seek her entertainment alone at bridge parties, etc. We have read too of the county agent's wife who is his office assistant. All of these, however, are more or less extreme.

But what of the county agent's children and his home? The county agent and his wife should have as their ideal a home. There is no greater calling than that of motherhood. The county agent's wife who keeps a good home and keeps the children in good health should not be expected to be an office assistant, nor fill the place of a home demonstration agent: she need not be tied to her home in such a way that she never gets out in friendly intercourse with her neighbors; she need not be so ignorant that she cannot answer some questions for farmer's wives; and she need not live alone in the sense of being a widow. Let us build up for the county agent and his family an ideal which will permit his family as well as himself to live natural, normal lives.

Any man who has had a college education (as practically all county agents have) and is in good health should make a living for his family without expecting his wife to do more than a wife and mother should. It is fine to have a wife who is capable of being a home demonstration agent, of taking shorthand, keeping records, etc. But isn't it a finer thing to have a fine home and fine healthy children? It takes a real home demonstration agent to keep a good home with healthy growing children, to provide proper environment for the development of the children's minds and bodies, to take the proper interest in the schools the children are attending as well as to practice up-to-date methods in the selection and preparation of foods. These duties and opportunities need not interfere with the county agent's

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"GOVERNMENT INSPECTED"

By Frank George
U. S. Department of Agriculture

"This new service promises to have far-reaching effects. You should know how it works, so read along—

"WHAT in Sam Hill do you mean by paying us fifty cents under the market?"

For reply the Secretary of the peach growers' organization produced a file of Government certificates. They showed that the peaches were not No. 1 but No. 2, and that the price returned to the members was in line with the lower grade.

The evidence was indisputable. The products had been officially inspected when loaded into the cars. What threatened to be a break in the organization was averted, and the growers went away resolved to produce a crop of higher quality.

Growers, shippers, railroad officials and buyers are loud in their praise of this new Federal-State shipping point inspection service. They say that it is making possible economies in the marketing of fruits and vegetables, and is having a far-reaching effect through inducing the production and marketing of standardized products. Better trade relationships are also resulting from mutual dependence upon inspection by a disinterested, official agency.

The service has been in operation less than three years, but its phenomenal growth stamps it as one of the really important recent contributions to modern agricultural marketing. More than 130,000 cars of produce were inspected at shipping points under the service during the past fiscal year as compared with 72,000 cars the preceding year. Inspection is available in 35 States under cooperative agreements between the States and the Federal Department of Agriculture.

Numerous letters in the files of the Department at Washington show that growers find the service of value as a check against prices paid by local shippers. The inspection certificate held by the shipper shows the actual condition and quality of the product, and a check-up on market prices for that grade of product quickly reveals whether the price is in line with the market.

Shippers prefer the new service to private inspection, because official inspection costs no more than the maintenance of a private inspection force, and it has the additional advantage of the Government-State certificate. The certificate is a virtual guarantee of the quality and condition of the products at shipping point, and is documentary

Potatoes lead in Federal inspections in terminal markets, nearly 7,000 carloads having been inspected last year.

evidence in any subsequent claims against the railroads for damage in transit.

The railroads are keen for shipping point inspection, because it provides unbiased evidence of the condition of the products at shipping point, and responsibility for damage may be promptly and properly ascertained. They see in the service a chance for reducing the cost of investigation bureaus in tracing claims, and a more efficient use of rolling stock through keeping inferior quality products out of the channels of trade.

Buyers in the central markets want shipping point inspection, because it guarantees the condition of the products. Many buyers in placing orders are demanding "Government certificate attached to bill of lading," and are advertising the products in the trade journals as Government inspected.

A PROMINENT fruit grower of Virginia, who recently returned from abroad where he visited the leading apple markets, declared that foreign buyers are demanding Government inspection because they have found that "Federal-State inspected apples can be relied upon to be of uniform quality and condition," which means higher prices in as much as non-inspected shipments are subject to a discount on account of wide range in quality.

The Food Products Inspection Service, which provided for Federal inspection of fruits and vegetables in receiving markets, was established in 1917 under Congressional authority. This service was the outcome of general dissatisfaction among producers over the uncertainties of consignment shipments. Without specific evidence of the quality and condition of the products, producers were compelled to accept the say-so of receivers as to the condition of arrivals.

Increasing use has been made of the inspection service in terminal

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SWEET CLOVER

By R. J. Silkett

Soils and Crop Specialist, Missouri College of Agriculture

SWEET CLOVER, once legislated against as a noxious weed, has now established itself as a valuable agricultural crop in almost every state in the Union. It is rapidly finding its place on Missouri farms as a pasture, hay and green manure crop. The value of the crop for increasing the fertility and improving the physical condition of the soil is shown by the experience of a Bates County farmer.

Mr. J. F. Kern had a 40-acre field on his farm that had been cropped continuously to corn for a good many years. The soil had become hard and puddled, difficult to farm, and the yield reduced to thirty or forty bushels to the acre. During the spring of 1922, Mr. Kern seeded this field to sweet clover using a light seeding of barley as a nurse-crop. A good crop of barley was harvested. The sweet clover was then pastured during the remaining part of the summer. By the first of June, 1923, the sweet clover was from six to eight feet high. Three horses hitched to a single section harrow with a man riding were used to drag it down. This enormous amount of green vegetation was then plowed under. The ground was thoroughly worked down and the field planted to corn. Mr. Kern harvested seventy-five bushels of corn to the acre from the field and greatly improved the fertility and physical condition of his land.

Sweet clover has no equal as a soil builder. Its extensive root system, its ability to take nitrogen from the air, its rapid and abundant growth and the rapidity with which this vegetation material decays when plowed under are characteristics of this valuable crop. As a hay and pasture crop, sweet clover

1924 spring seeding of sweet clover ready to be cut for hay on field near Vernoa, Missouri. This field is very sandy, low in fertility and badly eroded.

Sweet clover grown on this farm of Mr. J. F. Kern, Butler, Missouri. This crop was turned under in June, 1923, and planted to corn. Mr. Kern harvested 75 bushels of corn to the acre from this 40-acre field.

has an important place on any farm where livestock is kept. The crop, if cut when about two feet high, will make a hay of excellent quality with a feeding value very nearly the same as that of alfalfa. Sweet clover makes excellent pasture for cows, sheep, hogs and horses. Hogs should be ringed before being turned on sweet clover as they are very fond of the roots and may possibly destroy the stand by rooting. Sweet clover will not bloat cattle as is common with other clovers and alfalfa.

White sweet clover has a wide adaptation to different soil conditions. It exhibits a marked fondness for soils rich in lime, for rocky situations where little soil is available, for gravely moraines and for localities where the hard compact subsoil is exposed. The crop is equally well adapted to rich soils and responds readily to applications of phosphate and manure. Many acres in the middle west of little or no agricultural value may be turned into valuable grazing land with the aid of this important legume crop. In securing a stand on rough, wooded or stony lands that are untillable the seed may be sowed broadcast during the late fall or winter. The seed will be worked into the ground by alternate freezing and thawing of the ground or washed under by rains. In very sandy soils sweet clover is often drilled into the thin native sod by using a disk drill, as any other preparation of the seed bed would make it too loose. The most successful practice in seeding sweet clover is accomplished by sowing the seed during the winter, in January, February or March, when the ground is honeycombed with frost. Sowing on wheat or on the bare ground, as is commonly practiced with red clover, is the prevailing Missouri practice. It has also been successfully seeded with oats, or sowed alone, in well prepared fields, in April or May. If sowed at this time the seed should be lightly covered. It can also be grown successfully, if seeded at the end of the summer, during August or September, as is done with alfalfa.

Sweet clover should be seeded at the rate of twenty pounds of good quality scarified seed per acre. It is necessary that the seed be inoculated with its bacteria to insure

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A New *for the* AGRICULTURAL

By *Paul W. Chapman*
Georgia State Board for Vocational Education

IN less than four years there is going to be an alarming shortage of agricultural college graduates in this country!

Figures from the principal state agricultural colleges show that the enrollment has consistently been growing smaller for the past four years, while the number of young men and women preparing for the other professional and industrial occupations has grown apace.

This will mean that in the next few years it will be difficult to secure men and women who are well qualified to fill the *professional* agricultural jobs that require technical preparation. Agricultural colleges are going to experience difficulty in holding the members of their staff; experiment stations will have a hard time finding scientists; there will be more counties wanting agents than there are men available; and if all the men graduated in the next two years went into high school teaching work there would not be enough men available to fill the Smith-Hughes jobs that can be financed from funds already available.

This condition was brought about by the period of agricultural depression through which we have just passed. In many instances the funds for a college course could not be secured by the farm boys of the country; and in others, both the boys and their parents saw no future on the farm, or in any work connected with it.

It is unfortunate that so many people failed to recognize that this was but a temporary condition!

THE business of farming is as solid as the rock of Gibraltar. It will go on forever, and during the life of boys now in college, our population will become half again as large as at present—and they must be fed and clothed.

Aside from the possibilities of making money by directly applying an agricultural college education to the business of being a dirt farmer, there are almost an unlimited number of salaried jobs open to the agricultural college graduate. Many parents, and a large number of farm boys know nothing about these opportunities.

They should be informed! In other words, the agricultural colleges of the country to get back to

Field

COLLEGE

(In the establishment of Camp Williams, Georgia is blazing a new trail which may lead to rich rewards.

their former enrollment as soon as possible, as well as to provide for the *vocational guidance* of the farm boys and girls of this country, should see to it that the opportunities for congenial and profitable employment along agricultural lines is made clear to the youth of the states they are trying to serve.

There is no way as effective, in attaining this end, as to provide a plan for bringing the farm boys and girls to the college.

GEORGIA has done this in a rather unique way by the establishment of a permanent camp for the farm boys and girls of the state on the campus of the State College of Agriculture at Athens.

The camp is designed primarily for the use of the club boys and girls during the summer months, but it will also be used as a dormitory by a few students, it will at all times be open to visiting delegations of farmers, county agents and school boys.

The main building was erected at a cost of about $30,000. It was made possible through the donation of philanthropic citizens of the state. The first donation of $5,000 was made by J. J. Wilkins, a prominent banker of Athens, and the camp bears in his honor the name of "Camp Wilkins." The cots and equipment were paid for by the county and home demonstration agents of the state, each one taking the responsibility for raising at least fifty dollars. A lake costing $4,000 is one of the attractive features of the camp, and it will be of interest to know that the name of the lake is "Kirota," which is a combination of the words Kiwanis and Rotary in honor of these civic clubs.

Two hundred and fifty boys, or girls, can be accommodated at one time. During July the camp was open to girls and in August to the boys.

In all about 2,000 boys and girls enjoyed an outing at this summer resort where they had the advantage of all the physical equipment of the college, and the active interest and cooperation of the entire staff of instructors.

Each group spent a week in camp, arriving on Monday morning and breaking camp Saturday at noon.

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Soy beans in rotation without any fertilizer treatment. Average annual yield for 8 years, 12.8 bu. Net returns $35.80 per acre. Delaware Experiment Station.

Soy beans in rotation, fertilizer 250 lbs. acid phosphate and 75 lbs. of muriate of potash per acre. Average annual yield for 8 years., 23.9 bu. Net returns $61.00 per acre. Delaware Experiment Station.

FERTILIZERS *for Quality and Profit*

By George L. Schuster
Agronomist, Delaware Experiment Station

¶In our December issue, Mr. Schuster gave a summary of fifteen years' experiment in Delaware. Here he points out how quality and profit are affected by fertilizers.

IN the December, 1924, issue of BETTER CROPS the writer discussed some results with fertilizers in Delaware on corn, soy beans, wheat and hay, in which the following general conclusions were given: (1) that the lack of potash seems to be the first limiting factor in crop production, (2) when potash has been supplied, phosphoric acid seems to be the next element needed for maximum crop production, (3) the yields may be increased still further by the addition of nitrate of soda, (4) barn yard manure compares very favorably with the use of all three fertilizer elements, (5) the correct use of fertilizers not only increases crop yields but makes for more uniform yields in all seasons.

An increase in crop production is always desirable provided it can be done economically. The question of monetary returns from the use of fertilizers on field crops is always foremost in the mind of the grower. However, it is necessary to exercise caution in drawing conclusions on such a basis, because the value of a dollar is not always the same. Its value fluctuates, whereas the pound used in measuring crop yields is the same at all times.

In calculating the net returns reported in Table I. of this article the following values were used: nitrate of soda $60.00 ton, acid phosphate $16.00, rock phosphate $7.00, muriate of potash $48.00, basic slag $15.00, manure $1.85, cover crop $1.54 per acre; corn 75c. bu.; wheat $1.25, soy beans $2.50, fodder, wheat straw and bean straw $10.00 ton, and hay $18.00. The term "net returns" as used here means that sum which remains after the cost of the fertilizers, manure, cover crops, cost of applying and interest on additional investment has been deducted from the selling price of the crops produced. There remain items of variable cost to be deducted by the producer such as freight, hauling charges, and additional expense of harvesting, storing, insuring and marketing the increased crop.

Table I. shows that there is a return of $27.14 per acre where no fertilizers are used. Where nitrate of soda has been applied there is a loss. Where acid phosphate has been applied there has been a gain of $4.33 per acre remaining after all costs have been deducted. There

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A New Wrinkle *in* *Growing Alfalfa*

By Vance W. McCray

MOFFIT BROTHERS, Mechanicsville, Cedar County, Iowa, are bang up farmers. They are always trying out new ideas on their 800 acre farm which is devoted to livestock.

They believe in alfalfa and have discovered a new way of seeding it. Instead of sowing it by itself and losing the use of the ground for one year they limed their twenty acre field of corn which was to be put in the silo. The silo was tested by County Agent Obye and limed heavy enough to correct the acidity. At the time of the last cultivation when the corn was a little more than knee high they took a grass seeder and seeded the field to alfalfa. A narrow one horse harrow that would go between the corn rows was used for covering the seed. In a short time the alfalfa was growing between the corn rows. It made a rapid growth and was well along at silo filling time.

The corn was cut with a corn binder when the ground was dry and hauled off to be made into silage. After the corn was removed the alfalfa made a rapid growth and was well along when winter set in. After the field was frozen solid a railroad iron was dragged across the field to cut off the corn stubble. This left the field perfectly smooth.

The next spring the alfalfa made a rapid growth and was cut three times for hay yielding four and a half tons to the acre. By the latter

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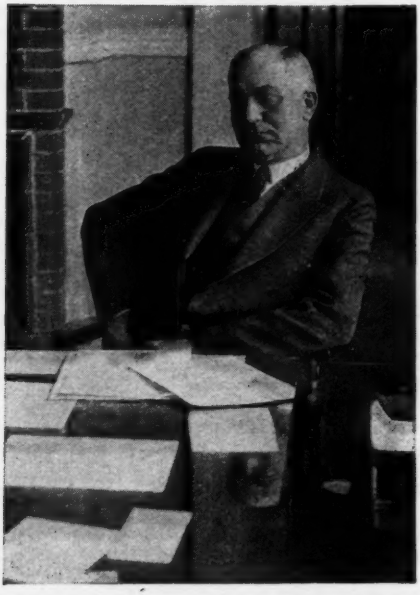
Knee deep in Alfalfa. Hereford cattle on the Moffit brothers farm Cedar County, Iowa. This alfalfa field was a corn field last year. This year it produced 4½ tons alfalfa to the acre.

Better Crops' ART GALLERY of the month

Dr. Andrew M. Soule, President of Georgia State College of Agriculture, the man who conceived the idea of building a permanent camp on the college farm for the farm boys and girls of the state of Georgia and the man who put it over without the state's appropriating one cent to help the cause. See Paul Chapman's article on page 10 of this issue.

Some prominent Middle Westerners. Left to right:—J. D. Hull, new president, Indiana Corn Growers' Ass'n; Sidney Anderson, Congressman from Minnesota; W. L. Harding, former Governor of Iowa; E. C. Elliot, President of Purdue University; W. D. Littlejohn, retiring President of Indiana Corn Growers; G. I. Christie, Director Purdue Experiment Station and for many years Secretary of the Indiana Corn Growers.



Ex-Gov. Robert D. Carey of Wyoming, head of the President's Agricultural Conference and mentioned as a probable successor to the place of Secretary of Agriculture.

Increasing

Sugar Beet Yields

¶The striking facts on which this article is based are worth the study of every one interested in profitable agriculture. This article is reprinted from Facts About Sugar.

THE December number of the *Continental Sugar Beet Grower*, the monthly magazine issued by the Continental Sugar Company, contains some interesting data as to the results obtained from the use of fertilizer on sugar beets under ordinary field conditions and also gives the company's recommendation as to the best fertilizer mixture to use on beets under conditions obtaining in its territory.

During the past season the company conducted seven fertilizer demonstration plots in different locations in northwestern Ohio and southern Michigan. Each plot consisted of approximately five acres, one-half of which was treated with commercial fertilizer prepared according to a formula worked out by the company's experts, while the other half of each plot received no fertilizer. The purpose of the test was to determine whether the application of fertilizer was financially profitable, and how much the additional net return, if any, amounted to per acre and as a return on the cash investment.

With this object in view the cultivation of the plots was placed in charge of practical farmers, who were instructed to give them only the same amount of care and attention ordinarily bestowed on their fields of sugar beets. The two halves of each plot received identical cultivation, the labor employed in blocking, thinning, hoeing, and harvesting consisting of ordinary field workers. There was no expert care or supervision beyond that applying to all the beets grown for the company.

The seed was sown in rows 22 inches apart and the beets were thinned to 12 inches apart in the row. Fifteen pounds of seed were sown to the acre and all the fields were harvested 160 days after sowing.

Gains from Fertilization

The fertilizer used consisted of a 2.43–10–12 combination of sodium nitrate, phosphate rock, and potash. It was applied broadcast at the rate of 450 pounds to the acre and was worked into the soil before seeding with an additional application of 100 pounds per acre of nitrate of soda after the beets were blocked and thinned. The total cost of the fertilizer was $12.50 per acre.

The average yield of beets on the seven fertilized plots was 3.87 tons per acre higher than the average of the non-fertilized fields. The following table gives the cash value of the increased yield and the net profit after deducting the cost of the fertilizer with beets selling at various prices from $6 to $10 per ton:

Value of beets per ton	Cash value per acre of increased yield	Net profit per acre from fertilizer
$6.00	$23.22	$10.72
6.50	25.15	12.65
7.00	27.09	14.59
7.50	29.02	16.52
8.00	30.96	18.46
8.50	32.89	20.39
9.00	34.83	22.33
9.50	36.76	24.26
10.00	38.70	26.20

With beets paid for at $8 per ton, which may be regarded as a fair average price, the gross return to the grower from the use of fertilizer was $30.96 per acre and the increase in his net profit was $18.46. The following table shows the gross return and the percentage of profit on each dollar invested in fertilizer with the same range of prices for beets:

Value of beets per ton	Gross return per dollar invested	Interest on investment, per cent
$6.00	$1.85	85
6.50	2.01	101
7.00	2.16	116
7.50	2.32	132
8.00	2.47	147
8.50	2.63	163
9.00	2.78	178
9.50	2.94	194
10.00	3.09	209

With beets selling at $8 per ton the grower received $2.47 for every dollar expended for fertilizer, or a profit of 147 per cent on the investment.

Potash Proportion High

The formula adopted for the fertilizer employed in these tests was unusual in that it called for a very high proportion of potash—12 per cent. In ordinary commercial mixtures potash seldom runs higher than 3 to 5 per cent. The proportion of the various ingredients was arrived at as the result of soil analyses and tests made by representatives of the sugar company, who reached the conclusion that a high proportion of potash was required in Ohio and Michigan to produce good crops of sugar beets. This conclusion appears to be fully justified by the results obtained. Another noteworthy feature of the method employed was the use of nitrate of soda after the young beets had been blocked and thinned, which is approved by the agricultural department of the company as it gives the plants a good start at a critical period of their growth.

As a result of numerous tests conducted by the sugar company at its experimental farm, using various combinations of fertilizing elements, the company recommends to its growers for the coming season the use of the same mixture employed on the field experimental plots as above described. On this point the following statement is made:

"Several fertilizer mixtures were compounded in the company's agricultural laboratory and were thoroughly tested at the company's experimental farm. In order that the various mixtures might be tested under different soil conditions, each of the aforesaid mixtures was used on experimental plots conducted by the company in various sections of northwestern Ohio and southern Michigan.

"While it is true that each of the mixtures gave favorable results, it was found that the mixture having the formula 2.43–10–12, in which the nitrogen was derived from sodium nitrate exclusively and the phosphoric acid was derived from Florida phosphate rock, gave the best results under all conditions. Therefore the Continental Sugar Company recommends this formula to all sugar beet growers who intend to produce sugar beets for the company during the coming year."

The Relation of SULFUR to Soil Fertility

¶Effects of Sulfur Under Humid Conditions

By Robert Stewart
University of Nevada

SULFUR is one of the ten essential elements of plant food. Sulfur bearing materials have been used as fertilizers for long periods of time, but usually incidentally as carriers of other well recognized elements of plant food such as phosphoric acid, potash and ammonia. Sulfur bearing materials such as gypsum have also been used primarily for their sulfur content occasionally during the past one hundred and fifty years, in fact, ever since Franklin tried it out on his farm in Pennsylvania, and Washington used it without success on his estate at Mt. Vernon.

Until quite recently, soil investigators have believed the demands of the plant for sulfur were so small that the limited supply in the soil was fully sufficient for the plant's requirements and that sulfur, like iron, need not be given any special consideration.

The sulfur question, in connection with soil fertility, has in recent years again arisen for consideration due to a number of causes.

One result of the late war was the development of a number of new sulfur deposits, and, of course, at its close a new market had to be developed for the products of these mines.

More recent work also has clearly demonstrated that the sulfur requirement of plants is very materially higher than was formerly thought to be the case. The requirements of most plants for sulfur is comparable with the plant's requirements for phosphorus and in fact, in some plants the sulfur requirements actually exceed the requirement for phosphorus.

For example, a hundred bushel crop of corn requires twenty-three pounds of phosphorus and seventeen pounds of sulfur; a fifty bushel crop of wheat requires sixteen pounds of phosphorus and eleven pounds of sulfur, while an eight ton crop of alfalfa hay requires thirty-six pounds of phosphorus and forty-five pounds of sulfur!

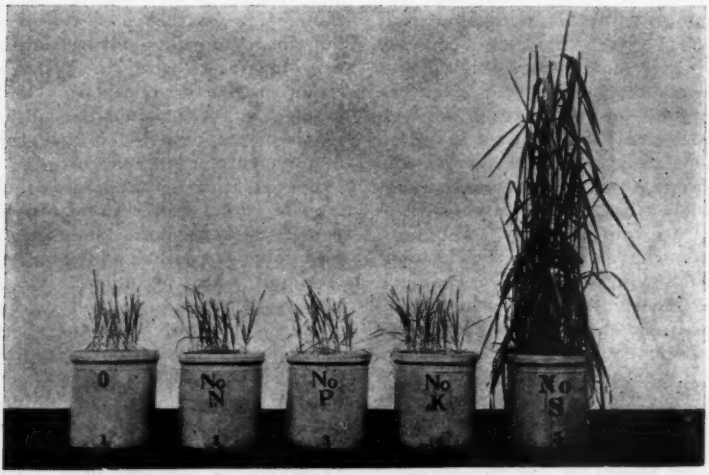
Sulfur differs from phosphorus in several important particulars. It occurs in the soil in a form soluble in water, or in an organic combination which is slowly changed into a soluble condition,

and hence may be readily lost in the drainage water. Sulfur, as sulfur dioxide, is a normal constituent of the atmosphere, and is constantly being added to the air whenever organic matter is burned. The burning of wood, coal and oil and the operation of smelters constantly replenish the sulfur content of the air. Sulfur, in the form of sulfur dioxide, is constantly being added to the soil by rainfall and direct absorption from the atmosphere. Sulfur is not required by the growing animal for bone production, while phosphorus is so required and removed from the feed. Sulfur occurs in large amounts in hay, straw, stover, etc., and consequently finds its way into the farm manure. Farm manure, therefore, contains slightly more sulfur than phosphorus.

The amount of sulfur lost in the drainage water is, of course, variable and depends on various conditions such as the soil treatment and system of cropping practiced. This is well illustrated by the data from Rothamsted where the loss of sulfur in the drainage water varies from twenty to eighty pounds per acre per year depending upon the soil treatment. Various European investigators report an even wider variation, some reporting a loss of only six pounds while others report a loss of two hundred and seventy pounds per acre per year.

THE most satisfactory data in this country upon this question is that reported from Cornell Experiment Station by Lyon and Bizzell. They report that, where manure was applied and a rotation of crops including clover was practiced, the loss of sulfur was 31.5 pounds. When the same treatment was applied and clover eliminated from the rotation, the loss of sulfur in the drainage water was 31.5 pounds; that is, clover did not cause a decrease in the loss of available sulfur in spite of its supposed heavy demands for sulfur. Apparently an excess of sulfur was present and available. When caustic lime was applied, the loss of sulfur was increased by ten pounds. Allowing for the amount of sulfur added in the manure, the

(*turn to page 35*)



This shows the effect of the absence of various elements in pot culture work (sand cultures) as compared with the absence of sulfur. Grain is not formed when sulfur is absent.

Where Wisdom Comes From

By E. W. Howe

BENJAMIN FRANKLIN has been called the greatest type and example of the citizen known in modern history, yet he had no early advantages, and lived as a kind of orphan, runaway or castaway in two hemispheres. His principles were extremely simple. ¶He did not claim perfection; he only tried to avoid mistakes as frequently as possible. He acknowledges that in his youth he was careless in paying a man he owed money; he admits some deception; he confesses to certain tabooed transactions with women, but experience proved the folly of these things, and he gradually quit them. In his many activities, Franklin was even called a thief, which has happened to many another decent man, but his accuser was a paid attorney who has been pronounced one of the world's greatest scoundrels. Others also criticized Franklin, because of envy, and their descendants have kept the quarrel alive to this day, but history writes him down as one of the world's notables. ¶As great a man as Lincoln or Washington, many think, yet his principles of life are stated in a line: In his journey through life he had a desire to be as little as possible either an incompetent, a fool, an idler or a rogue. He always gave his private business sufficient attention to make it prosperous, but did not neglect his duty in public affairs; he took an interest in street lighting and paving, in libraries, in fire departments, in social life, in home guards, in schools, etc., and was so modest and efficient in all these respects that he became an ambassador to look after his country's affairs abroad. And he became noted in science, and one of the world's best-educated men, although he almost never went to school. ¶He is credited with great wisdom. Where did he get it? You may find the answer in his books. In "Poor Richard" he wrote: "I am conscious that not one-tenth of my wisdom is my own; it is rather the gleanings I have made of the sense of all ages and nations." This source of wisdom is available to all of us; the best and oldest philosophers have quoted each other, and their final conclusions have trickled down through the ages until they have reached those with whom we associate; the best thought of the ancients has become a part of the common talk of people everywhere today. ¶The humblest may find encouragement and instruction in the life of Benjamin Franklin, and adopt his rule of life with profit. Franklin had all the weaknesses you have, but kept them down. You may do it; and rest assured that this effort will pay you better than any other in which you can engage.

Something to Be on Your Guard Against

By Albert A. Hansen
Purdue University Agricultural Experiment Station

(The series of articles on poison plants by Prof. Hansen was one of the most popular we have run. You'll be glad to hear from him again along the same lines.

LAST month Henry Schroeder, a farmer of Lamar, Indiana, brought several bushels of potatoes out of storage and found that they were covered with young sprouts. The little green sprouts were wiped off by hand and cast out the kitchen window to help fatten the poultry. A few hours later a number of the birds became ill and eighteen died.

Unsuspicious of the potato sprouts, the same thing happened a short time later, and this time twelve chickens died after partaking of the dangerous little green sprouts. Experiments and experience have demonstrated that potato parings, wilted tops and the sprouts contain a poisonous principle (called *solanin*) that may prove fatal to livestock, particularly when the parings or sprouts are green. Animals have died after eating potatoes that had greened following exposure to sunlight after having lain on the ground subsequent to digging. Old sprouted potatoes, it has been demonstrated, are poisonous to horses, even after boiling. When a cow that died as a result of eating liberally of potato parings was posted, the liver was found to be enlarged and the intestines showed hemorrhages. Ordinary white potatoes contain a mild poison to which, however, few folks are susceptible; most of the toxic principle is probably boiled out, since the water in which potatoes have been boiled is said to be slightly poisonous. Two members of a Vandalia, Illinois, family died last fall after eating greened potatoes. The cases were diagnosed as potato poisoning by attending physicians.

The common potato belongs to a group of plants that includes a number of toxic species. There is bull nettle, for instance, the fruits of which contain the dangerous alkaloid *solanin*. Recently a number of sheep died mysteriously on an Indiana farm and the autopsy of Dr. O. H. Nelson, a veterinarian of Advance, Indiana, revealed that the stomachs contained large quan-

tities of bull nettle berries and that the intestines were badly inflamed.

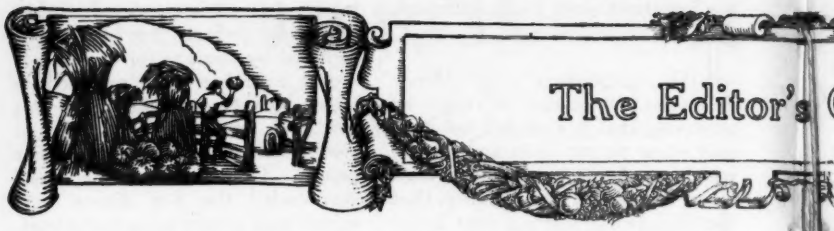
THE experience of Henry Schroeder illustrates a type of poisoning that is unusual, but that may occur on any farm and against which we should be warned. How many of us know, for instance, that the trimmings from a privet hedge are fatally poisonous to stock? The only thing to do after trimming a privet hedge on the farm is to rake up and burn the cuttings. Another common ornamental that is poisonous is the castor bean plant, frequently found near dwellings. Down in Greene County, Indiana, a calf died after eating the tops of this species. I also recall the case of a student at the old Central Manual Training High School in Philadelphia, who ate three castor beans that were used for demonstration purposes in the botanical laboratory. He was away from school for exactly three days and almost died, since castor beans contain a dangerous toxic principle.

It may be news to most folks to learn that the bulbs of narcissus, jonquils and daffodils contain a toxic principle called *narcissine* that has caused considerable suffering to folks when eaten in soups and stews where they had been included by mistake for onions. A recent case has been reported in which a single narcissus bulb was used by mistake in preparing a stew that was partaken of by five people. Even before the meal was ended the five diners were seized with severe spasms of vomiting and trembling. Since the quantity eaten was small, the victims all recovered. In view of the dangerous character of these common flower bulbs, it is part of wisdom to store them in places where there is no likelihood of confusion with onions. Cases of narcissus poisoning in cattle, goats and pigs have also been recorded. The bulbs cause convulsions and intense inflammation of the digestive tract.

A form of poisoning that is not well understood, but that seems to be fairly widespread, is caused by alsike clover and is evidenced by the formation of sores in the mouths and on the legs and bodies of white spotted horses and mules and white hogs. When alsike clover is pastured, it is well to keep on the lookout for the tell-tale sores. The

(*turn to page 44*)

Green sprouted potatoes, the cause of the loss of 30 chickens on one Indiana farm.



A SIGNIFICANT REPORT

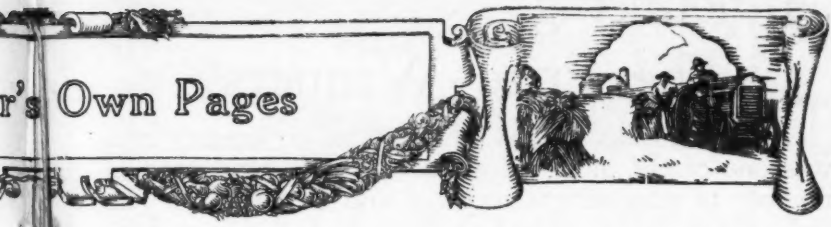
The Agricultural Conference on Agricultural Legislation has made its report to the President. The personnel of this Conference and the importance that has been attached to its work give this report more than ordinary significance.

In reading over this report I was impressed by the restraint and good sense which characterize most of it. The Conference has wisely recognized that a minimum of governmental interference and domination will permit the soundest development and, in general, their recommendations look to assisting and fostering farmer projects rather than attempting to impose any set solution of agricultural problems upon the farmer.

There will doubtless be vigorous protests in some quarters because the Conference has come out so openly in favor of cooperative marketing and is recommending government cooperation and assistance for marketing associations.

If the government were to attempt to force farmers into marketing associations or to dictate the organization and policies of these associations, I should feel some cause for alarm, but nothing of the kind is contemplated in the measures recommended by the Conference. The point of these measures is that, if farm marketing organizations want advice or information from government agencies, it will be given them, which seems entirely proper and sensible.

The amendment to the Agricultural Credits Act, the recommendations regarding freight rate legislation, unappropriated public domain, increased appropriations for state experiment stations, and other minor recommendations will meet with general approval.



Opinions will differ regarding the recommendations for an increased tariff on agricultural products. The Conference believes this can be done "without the necessity of dislocating the present adjustment involved between the wage scale of the country and the cost of living," but it fails to go into particulars. The general argument seems to be that since industry receives high tariff protection, agriculture should as well.

I have always hoped that the day would come when the tariff would be considered for what it is—an economic question to be settled by trained men on the basis of ascertained fact. It is still considered a kind of political football which everyone has a right to kick, so one can hardly blame the farmers if they want to get in their whacks at it.

I am somewhat disappointed to note that the Conference's recommendations call for the creation of two new boards. Considering the hundreds—nay thousands—of bureaus with which we are already burdened, the creation of more, however desirable they may seem, can hardly be accounted a blessing.

Some day it may be that a Commission will recommend the abolition of a few boards and bureaus, and then we shall know that the millenium is at hand.

Let us be grateful to the Conference at any rate for its temperance and conservatism. They have stuck to sound principles in the main and have given evidence of a real desire to help agriculture.

Jeff McDermid

Announcing The Prize Winners!

THE prize essay contest which ended on January 17th was one of the most successful we have conducted in number of manuscripts received and in quality. The judges, Mr. B. H. Pillard and myself, had a busy time reading over each manuscript carefully and then weighing the merits of the various contestants on each subject.

After due consideration, we decided that the following people submitted the best manuscripts on the respective subjects:

The Importance of Raising High Yields at Low Cost

Ford S. Prince, County Agent, Xenia, Ohio.

Why We Should Diversify Crops

Paul Tabor, Associate Professor of Farm Crops, State College of Agriculture, Athens, Ga.

The Value of Maintaining Soil Fertility

Harold M. Vaughn, County Agent, Manistee, Mich.

How Cost Account Records Help the Farmer

R. W. Wallace, County Agent, Chillicothe, Ohio.

A check for $20 has been mailed to each of the prize winners. Mr. Prince's article appears on the opposite page. The others will appear in succeeding months. We hope also to publish some of the manuscripts that, while falling short of the prize, were yet of high merit and interest.

To all who contributed material I want to extend our heartiest thanks. We expect to start another such contest shortly and hope you will try again.

Yours to a cinder,

Jeff

Raising High Yields *at* Low Cost

By *Ford S. Prince*

County Agent, Xenia, Ohio

AFTER the world war and after the urge for big crops was over and farm prices were skidding toward the bottom, a good many farmers seemed to hold a grudge toward anyone else who had ever sponsored increased crop yields. The period of low prices has lasted long enough to cause farmers to do a lot of thinking and some figuring, and many of these same complaining men are swinging back into line upon a program of high acre yields because studies in production costs have proved conclusively that high yields and low costs are always inseparable companions.

Since January 1st, 1920, twenty farmers in Greene County, Ohio, have been keeping cost accounts under the supervision of a trained accountant from the Ohio State University. A glance at the yearly summaries of these men on the cost of producing different crops and livestock is enough to convince even the most skeptical that if the farmer is to make money he must secure good yields.

A striking example is to be found in the costs of 1922 when one man had two fields in wheat. The yields were 27.3 and 13.1 bushels per acre respectively, the total acre costs 25.83 and 25.61 which meant a cost per bushel of 95c. and $1.80. for growing wheat on the same farm. A further analysis of the individual costs of different operations showed that all factors figured about the same except the charge for fertilizer which was $1.60 more per acre on the high yielding field. Available plant food enabled this grower to market one field of wheat at a profit, while a lack of it on the other proved to be so serious a factor as to cause a loss.

A summary of the 1924 wheat costs in this same group shows that on farms where the yield was over twenty bushels per acre the cost of production was 70c. per bushel, while the cost on those farms securing only twenty bushels or less was 89c. These figures might be further multiplied for corn, oats and other crops to prove the same general principle.

Nor is it necessary to stop with crops when substantiating the point. A high yield of pigs per brood sow is just as essential in economical pork production. On these same

farms in 1921, the men who averaged 9.5 pigs raised from each litter grew them for market at a cost of $5.74 per hundred pounds while those averaging but 4.6 pigs paid for the lower number at a cost of $10.51 per hundred pounds.

On eleven poultry farms keeping receipt and expense records in the county during 1924, the five better flocks averaged 132 eggs per hen and paid their owners an average labor income of $2.85 per bird, while on the six poorer farms the average hen laid but 86 eggs paying her owner but 18c. for the time spent upon her.

The important thing in producing high yields is to know how to do it economically, bringing into play a nice balance between man labor and the other factors essential for producing crops and stock. For crops these factors are, briefly, a supply of available plant food, acclimated seed of a high yielding variety, good drainage, a well prepared seed bed and proper tillage.

Feeding a balanced ration is one of the main factors in getting good yields from livestock. It is the extra feed over that necessary to maintain an animal which pays the profit, whether it be fed to a hen, a dairy cow, a hog or a steer. Fresh air, exercise and warm, sanitary quarters are all necessary for profitable animal production. Care of the brood sow at farrowing time usually spells profits in the hog business.

Each farmer will have to figure out for himself what his limiting factors are and remedy them in order to get the sort of yields which mean low costs. Competition in farming is becoming more and more keen. Constantly increasing yields per man will necessitate working on narrower margins. Slovenly production will eliminate many farmers who cannot keep pace with improved conditions to make room for the live, wide-awake man who looks upon farming as a business and the farm as a home rather than a place to eke out an existence.

Farmers with this viewpoint who are now growing good yields and marketing crops and stock above cost, are building homes and equipping them and making our rural communities the best places on earth in which to live.

Economy in Buying Fertilizers

Five million dollars will probably be spent by New Jersey farmers for commercial fertilizers during the year 1925, according to Prof. A. W. Blair, soil chemist of the New Jersey Agricultural Experiment Station.

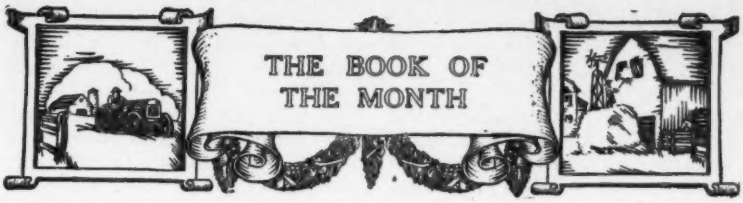
"At a time like this when the odds seem against the farmers in so many ways," suggests Professor Blair, "it is well worth while for him to consider carefully his investment in fertilizers in order that the money may be wisely spent. Will this five million dollars buy the most plant food possible, or will it go for just 'fertilizers?'

"Ten tons of a 5–8–6 mixture will carry 3,800 pounds of plant food; ten tons of a 3–8–3 will carry 2,800 pounds of plant food, but the freight and handling charges on the latter will be just as much as on the former, which carries 1,000 pounds more of plant food.

"There are truckers and potato growers who could well afford to use a still higher-grade fertilizer, a 6–8–7 for example. Ten tons of this will give 4,200 pounds of plant food as against 2,800 in ten tons of a 3–8–3.

"But why confine the high-grade fertilizer to truck and potatoes? For corn 250 pounds of the 6–8–7 would be quite as effective as 500 pounds of the 3–8–3, and from the standpoint of freight and handling much more economical.

"In purchasing fertilizers for 1925, it will pay to cut to the minimum the cost of freight and handling, and increase to the maximum the money that goes into actual plant food."—*Hudson Observer.*



The Agricultural Situation

The Agricultural Situation, by G. F. Warren and F. A. Pearson, New York. John Wiley and Sons, Inc., 1924. Pp. xvi—*306.*

Those who remember Professor Warren's *Bulletin 999,* issued by the United States Department of Agriculture some two years ago, and who have followed his subsequent articles and addresses will find this volume covering familiar ground. It brings together all these scattered materials between the covers of a single book, supplementing it with additional data and discussion. Out of a total of about 300 pages, well over a hundred are given over to tables (150 in number), and charts (106 in number). Many of these are referred to only indirectly or not at all in the text, but they represent a large amount of computation, chiefly of index numbers from the original data, and thus make accessible a wealth of material to any student who wishes to study further into the problem.

In general plan, the book consists of three introductory chapters presenting a general statement of the nature and causes of the depression, followed by four chapters on "Effects of Deflation on Agriculture and Industry," "Taxes," "Debts" and "Freight Rates." From Chapter VIII to Chapter XX, inclusive, there follows a detailed recital of what has been taking place, stated first in general terms; then contrasting trends of retail, wholesale and farm prices; followed by special discussions of regional phases of the problem, and of the particular situation with reference to all the principal and many of the minor agricultural products. Thereafter, we resume the thread of Chapters V, VI and VII with a chapter on "Farm Wages" (XXI) and "Value of Farm Land" (XXII). The last six chapters in the book may be regarded as another group dealing with measures of farm conditions, the analogy of other agricultural depressions, the effects of the present period of maladjustment, the probable future course of prices, and methods of adjusting to or remedying present difficulties.

The general thesis of the book is stated promptly in the opening sentence, which says: "The outstanding cause of the agricultural depression is the low price of farm products compared with taxes on farm lands, payments of interest, wages and prices of things that farmers buy," this low price being ascribed primarily to "deflation." To be sure, other causes are touched upon as being contributary to the general result, but they are dismissed at the end of Chapter III with the following observation: "While each of these factors as well as others have contributed to the agricultural depression, none of them could have brought on a severe depression. The primary cause of the agricultural depression was financial inflation followed by rapid deflation." This general position is reiterated either directly or indirectly throughout the book, wherein "deflation" is made the

goat for the economic sorrows and sufferings which have been the farmer's lot since 1920.

In view of the fact that so much weight is caused to rest upon this explanation, it seems somewhat unfortunate that the term was not more carefully defined and some single definition of it more rigidly adhered to. In many places, it seems to mean just what it so commonly is made to mean in the language of the street, namely, the decline of prices, with inflation meaning a marked or widespread advance of prices. This would seem to be the only sense in which it could be made to fit in the statement (page 273). "The populist movement of the last century was the farmer's expression of his opinion of prolonged deflation." Does it also fit the sentence (page 17)? "If the price level is too high, it results in all the objectionable features of inflation"

It is clear in many places that the authors mean more than rising and falling prices in using this term to explain the agricultural situation. On page 250 they say explicitly "Inflation and deflation are a money question. Expansion and contraction of the currency produce violent fluctuations in prices of articles bought and sold by farmers and become a subject of intense controversy." Elsewhere in the book this money phase of the question is related both to the production and international transfer of gold, the size of our "stocks of money," and the action of banks in extending or limiting their loans and discounts. Back of this all, however, looms the sinister figure of the Federal Reserve Board which, through its discount policy, is represented as having had chief responsibility for the depression in agriculture.

From the point of view of the reviewer, the chief disappointment of the book is in the failure of the authors to explain precisely how such a discount policy operates as a prime factor in the activities of the business world, and how, if interest rates are in fact the significant motive force in business, the same discount policy which oppressed the farmer in 1920-21 ushered in an era of prosperity to other industries and trade. One might ask also why the subsequent lowering of the discount rate has not done more to rehabilitate agriculture or whether this is indeed the cause of the present price of wheat. The matter is not rendered any more clear by the fact that when the authors, in Chapter XXV, turn to examine "Probable Future Prices," they limit themselves to a discussion of the future of our gold supply. Following this same thought, one might be inclined to query further the sense in which, according to Warren and Pearson, we are still in a period of deflation, since, in their closing chapter, they urge the "discontinuance of deflation" as the first of their remedies for the agricultural depression. In this section they say: "The agricultural depression is primarily due to two factors: first, the disparity between farm prices and prices of things that farmers buy; second, the disparity between farm prices and payments of taxes, interest and debts. The first of these might be corrected either by raising the prices of things farmers sell, or by lowering prices of things they buy. The second can only be corrected by raising the prices received by farmers, because public and private debts remain fixed in dollars, regardless of prices." This seems to harp back to the use of deflation in the sense of low prices and to give us as a remedy the raising of agrciultural prices. While everybody doubtless would agree that such an advance of agricultural prices would solve the farmer's problem, the means by which it is to be effected is left in obscurity.

This book is a treasure house of information for those who would study the present agricultural situa-

tion. While the authors have not furnished a key to open this treasure house, both the data assembled and the discussion with which it is accompanied offer a profitable field of labor for any student seriously interested in understanding the difficult situation of our agriculture and the processes by which it can be bettered.

E. G. NOURSE,
Institute of Economics.
Washington, D. C.

What Agriculture Needs

By BETTER CROPS Readers

More backbone, less wishbone, fewer automobiles, tractors, and trucks. Better farm help. Better care of farm stock and farm machinery. Less credit. Localization of crops. Economy actually applied. Use of County agent till it hurts (the Agent).—*Charles O. Bird, Farmer, Member K. S. F. B. Board, Atwood, Kansas.*

Equality of rights with other industries — especially those industries inter-related to agriculture. If the manufacturer has protection then the farmer is also entitled to protection. If American labor is protected then our products ought also to have a similar protection. Agriculture must work out basic principle for farmers and stick to them until obtained.—*Frank Zentmice, Farmer, Oakland, Iowa.*

Grow all the feed and food crops needed on the farm if possible. Keep 100 good hens per farm, one to three brood sows, keep the number of productive dairy cows that can be pastured, fed and handled to best advantage on the farm. Spend surplus time, energy and land on cotton as a truly cash (not credit) crop.—*L. A. Higgins, Extension Worker, A. and M. College, Mississippi.*

(*turn to page 34*)

JUST PUBLISHED!

The Agricultural Situation

Economic Effects of Fluctuating Prices

By G. F. WARREN, Ph.D. and F. A. PEARSON, Ph.D.

Professors of Agricultural Economics, New York State College of Agriculture, Cornell University

THIS most timely book gives a general and constructive analysis of the causes, extent, possible duration and effects of the agricultural depression. Prepared by two well-known authorities, it discusses, without bias, the factors that influence price relationships between agriculture and individual products. It includes relationships between agriculture and industry.

There are given 151 tables showing price relationships, not only for agricultural products, but also for wages, freight rates, farm machinery, and the like. It also includes 106 figures illustrating price changes and laws of prices.

"The authors have an unusual —almost uncanny—insight into the future by reason of having studied the past so carefully," *writes one reader.*

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B. C. 2-25

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As part of our educational work we are issuing a series of booklets on various crops. The purpose of these booklets is to show by facts and figures how proper fertilization brings the farmer a greater income both through increased yield and improved quality.

Each booklet has been written by an authority in the field who is in touch with the latest reliable information on the subject. This information has been presented in a popular, readable form with numerous illustrations of actual results. The following booklets are now available for distribution.

BETTER TOBACCO: This is a new edition of the booklet that was in great demand last year. It has been completely revised to cover all types of tobacco and all tobacco growing districts in the country. It includes as well a valuable section on sand drown.

BETTER TRUCK CROPS: This 48-page booklet deals with the cultivation and fertilization of the principal truck crops. Each crop is treated separately and information on seeding, varieties and proper fertilization is given for each crop.

BETTER POTATOES: Methods of seeding, planting, cultivation and fertilization are discussed in this 48-page booklet. The various potato-growing regions of the country are treated separately making this an unusually comprehensive work.

Any or all of the above booklets will be sent free upon request to any reader of BETTER CROPS. If, after reading your copy, you desire more for educational work, we shall be glad to furnish them as long as our supply lasts.

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Using Agricultural Magazines

By Joe M. Goodman
County Agent,
Effingham, Kansas

One of the good sources of obtaining timely information is through the many agricultural magazines which come to the county agent's office from time to time. Too often this source is entirely overlooked. I first hit upon this method by tabulating each article I could find that I thought I might use in carrying on my dairy work in Atchison County. That has been more than a year ago. Now I have a regular file for Agricultural magazines. The magazines filed are *Hoard's Dairyman, Successful Farming,* BETTER CROPS, *Breeders' Gazette, Farm Life,* and one or more others. It is not always necessary to file all of the numbers of a journal as sometimes nothing appears which will fit in one's territory. However, each number is carefully looked over by me and all articles that may be used are checked.

The farm magazine is then turned over to the stenographers, who tabulates the articles on 4 x 6 cards which are filed alphabetically. Contrary to all past rules they are not then forgotten. Hardly a day goes by that these are not used. For instance, John Jones comes to the office and wants to know something about contagious abortion. The clerk refers to the file of tabulated subjects and finds under the heading the subject, "Abortion in Cattle," this card states further that this subject is discussed on page 148 *Hoard's Dairyman* of August 29, 1924.

Possibly the Agent wants to get up a talk or a news article on a cooperative creamery or how he may help one that is struggling for existence. He again asks his clerk to see what subjects may be tabulated under this head and finds the subject, "We pulled our Creamery out of the Rut," *Farm and Fireside,* 10/24, page 8. This being a monthly publication, the month, year and page appear only.

Perhaps the agent is laying plans for a soil testing campaign. He finds some good material taken from the little magazine, BETTER CROPS of the October issue, which tells him just how to proceed with the testing for soil acidity.

These are only three subjects we have used, but the files contain a large number of interesting subjects which we used for immediate references.

North Dakota Boys and Girls Achievement Institute

By R. C. Newcomer
County Agent, Mandan, N. D.

The North Dakota Boys and Girls Achievement Institute is an annual meeting of boys and girls club members who have achieved success in their chosen projects, throughout the state, during the past year.

It was my good fortune to attend the Fifteenth Annual Institute held at the Agricultural College during the week of December 15 to 20, and act as chaperon for six boys and girls from my own (Morton) County, who had successfully completed their year of organized club work, and because of their meritorious endeavors were chosen to represent their various clubs, and likewise receive the reward of a trip.

Two hundred and twenty-two boys and girls from twenty-five different counties of the state were present; all wide awake youngsters who had accomplished something outstanding, and all eager and desirous of learning something from the splendid program arranged for them by the State Club Leader, H. E. Rilling, and other Extension officials.

The first day was given over to a general inspection of the Agricultural College, and explanations were given in regard to the work carried on there. It was also the "get acquainted" day. Robina Wylder, President of The Boys and Girls Club Institute organization, and a club member herself, conducted all regular meetings, with more ease and executive acumen, than many older people often possess.

The talk by Dr. Coulter, President of The North Dakota Agricultural College, in which he displayed a map on North Dakota, showing that the state lies just half way between the equator and North Pole, made a striking impression on the whole delegation. A rather novel organization of the entire delegation into a Circus, was perfected by Prof. Arvold of the College. It was a real circus consisting of everything from monkeys to pink lemonade. Movies, plays, basketball games and the like all had their part in the entertainment. Much instructive work was given also in cooking demonstrations, table service, sewing work for the girls; and poultry judging, corn and grain judging for the boys. A club paper, *The Flicker Tales* was edited daily by the members of the institute.

The various civic organizations of Fargo joined in giving a banquet to the Club members and the Chaperons, as well as a large number of the members of Extension Division. The Institute president, Miss Wylder, acted as toastmistress, and various club members responded with extemporaneous talks, with surprising ability.

The outstanding feature of the whole session was the obvious enthusiasm for junior Club Work. When one thinks of those two hundred and twenty-two boys and girls returning to their homes in different parts of the state, imbued with the experiences and inspirations of such a week of endeavor, one cannot help but feel that the young farm folks are being trained for future leadership, and that Junior Club work is playing a fundamental and important part, in a demonstrative and practical way, in North Dakota.

What Agriculture Needs

(*From page 31*)

Economical, cooperative production, followed with cooperative marketing of every farm commodity. (The latter will possibly precede the former.) The marketing contract should contain a clause regulating production, in such a manner that any surplus, created, loss to be born by individuals causing it.—*Waldo E. Steinberger, Farmer, Urbana, Ohio.*

Less crops destroyed by insects. The Chinch bug gets too much of the farmers corn. The Hessian fly too much of his wheat. The potato bug too many potatoes and Coddling moth too many apples. A constructive protective measure must be taken for every insect pest.—*E. G. Kelly, Entomologist Manhattan, Kansas.*

Sulfur and Soil Fertility

(*From page 20*)

net loss of sulfur in the drainage water was 16.0 when a rotation of crops including a legume was grown, and this loss was further increased to 25.5 pounds where burnt lime was included in the treatment. This loss is in addition to completely meeting the requirements of the crops grown and must represent an annual excess of usable material. Two questions are perfectly justified at this point and require careful and serious consideration. Must this loss of sulfur from the soil be replaced by the addition to the soil of sulfur bearing materials? Why add more soluble sulfur, which only increases the amount lost in the drainage, when there is already an excess of available sulfur in the soil which the plant refuses to utilize?

Another element of plant food, nitrogen, is likewise lost in the drainage water in large quantities under certain conditions. These conditions have been studied by Babcock with lysimeters at the Geneva Experiment Station. His work extended over a period of several years, and he found that the loss of nitrogen from the soil kept in sod was less than one pound per acre per year. The loss of nitrogen from the soil, which was cultivated but not cropped, varied from 132 pounds to 234 pounds per acre per year. That is, under a system of cropping, the essential plant food element, nitrogen, was practically entirely removed from the drainage water due to the demands of the growing crop. Therefore, in a native condition, the loss of nitrogen is reduced materially since the soil constantly grows a crop, and the actual loss is in part taken care of by fixation of atmospheric nitrogen by various agencies.

The work of Lyon and Bizzell at Cornell, on the other hand, shows quite conclusively that sulfur is not so reduced in the drainage water by cropping. Hence the sulfur in the drainage water must represent the excess of usable material. Their results show conclusively that the amount of sulfur in the drainage water is five or six times as great as is the amount removed by the crops. Moreover, if sulfur is lost from the soil in such large quantities as some investigators would have us believe and there is no compensation as in the case of sulfur, cultivated soil should very soon be actually devoid of sulfur. The soils of Kentucky, for example, having an average sulfur content of 438 pounds, should be completely deprived of sulfur in ten or fifteen years unless sulfur is constantly being added in appreciable quantities from some source. In addition, we should always remember that sulfur must be constantly lost from virgin soil as well as cultivated soil since the Cornell data show conclusively that cropping does not reduce the sulfur lost in the drainage water.

The atmosphere contains a variable quantity of sulfur as sulfur dioxide, and although small in quantity, it is of tremendous significance in this connection. The amount of sulfur dioxide is quite appreciable near smelters or large cities, and cases have frequently been reported of damage being done to vegetation and household fabric by the production of sulfuric acid by the oxidation of sulfur dioxide in the air. Undoubtedly the amount of sulfur dioxide in the air is less in the open country than near large cities. But whenever coal, oil or wood is burnt, the sulfur in a large measure escapes into the air and the supply of sulfur in the air is thus constantly being replenished. It is removed by rainfall and thus added to the soil supply. The amount so added is very appreciable and fully

sufficient for the food requirements of plants, and accounts for the loss in the drainage water.

SOME important results have been obtained at the University of Illinois on this phase of the question during the past seven years. In 1912 a rain gauge was established on the roof of the Agricultural Building. The rain water was collected and measured and monthly samples were analyzed for sulfur and various forms of nitrogen. The results obtained are very significant. The amount of sulfur varies from month to month and from year to year. As an average of the seven years, 45.1 pounds of sulfur are annually brought down in the rainfall and added to the soil at the average rate of 3.8 pounds per month. During the growing period for corn from May to September, 18 pounds of sulfur are added.

In 1915, the Hopkins' Soil Bins were constructed to study certain special problems in soil fertility. These bins are located on the Urbana North Farm under actual field conditions. Three years' results on the rain water collected are available from this source. As an average of the three years, 40.6 pounds of sulfur are annually added to the soil in monthly installments of 3.4 pounds. During the growing period for corn, from May to September, 16.4 pounds of sulfur are added to the soil under actual field conditions.

FROM the data presented, it is quite evident that the sulfur supply of the soil is automatically replenished from the atmosphere, and that the relation of sulfur to soil fertility is not in any sense similar to that of phosphorus. For example, to produce a hundred bushel crop of corn requires 17 pounds of phosphorus and 9 pounds of sulfur for the grain alone. The phosphorus must come either from the soil or applied materials and there is no other possible source; on the other hand, the results obtained at the Hopkins' Soil Bins, under actual field conditions, indicate that an average of 16.4 pounds of sulfur are added to the soil during the growing season for corn, from May to September, and this sulfur is added in monthly installments, of 3.4 pounds. We would be very fortunate, indeed, if our phosphorus, nitrogen, potash and limestone problems could be so easily solved. From these results, it is surely evident that under humid conditions sulfur need never be added to the soil as a plant food.

Fortunately also, sulfur bearing materials have been used as fertilizers for a long time, but largely incidentally with other materials. Gypsum, it is true, has been occasionally used as a fertilizer in an indefinite way by many farmers with various results. It has been used in an experimental way by the Pennsylvania and Ohio experiment stations.

The data obtained at the Pennsylvania station is wholly negative and shows no benefit at all from the use of gypsum. Plots 13 and 33 received an application of 320 pounds of land plaster, gypsum, applied in alternate years. The 35-year average yield, where gypsum was used were, corn 36.1 bushels, oats 31.3 bushels, wheat 13.4 bushels, hay 2,378 pounds. while the average yield of the untreated plots were, corn 37.2 bushels, oats 31.6 bushels, wheat 13.4 bushels and hay 2,460 pounds.

The results from the Ohio station are more favorable. The 18-year yield of crops obtained at Ohio, where barnyard manure was used were, corn 56.11 bushels, wheat 21.37 bushels, and hay 3,668 pounds. When the manure was reinforced with 320 pounds of gypsum, the yields were 61.05 bushels of corn, 24.30 bushels of wheat and 3,897 pounds of hay. The 320 pounds of gypsum had

actually increased the yield of crops as follows: corn 4.94 bushels, wheat 2.93 bushels and hay 229 pounds. When, however, the manure was reinforced with rock phosphate the yield of corn was increased by 8.96 bushels, wheat by 4.33 bushels and hay 893 pounds, while acid phosphate which contains both "available" phosphorus and gypsum has produced an increased yield of corn 925 bushels, wheat 5.44 bushels and hay 887 pounds. The gypsum in the acid phosphate has apparently little if any effect. There is no evidence from this reliable experimental data to warrant the use of gypsum as a source of sulfur for ordinary crop production.

We must conclude that under humid conditions the sulfur problem, in relation to soil fertility, is not in any sense similar to the phosphorus problem, but rather has a relation to soil fertility similar to that of carbon.

NEXT MONTH'S
BETTER CROPS

Keep your eye peeled for the next issue of BETTER CROPS! *It will contain some unusually interesting and helpful articles. Among the features we are planning are an article on the boll weevil by C. E. Gapen, of the U. S. Department of Agriculture, "Raspberry Anthracnose and its Control" by C. E. Baker of the Purdue Experiment Station and an article on the Laredo soybean by H. C. Appleton of the Georgia State College of Agriculture, Another of our prize editorials, "Why We Should Diversify Crops," by Paul Tabor will appear in this issue.*

About Ourselves

BETTER CROPS is a monthly magazine edited primarily for those who act in an advisory capacity to the farmer.

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More Profits from your Tobacco Crop

THE profits you make on your tobacco crop this season will depend largely on your success in getting a high yield of good quality at a low cost per lb.

"Experiments show," says a noted expert, "that no other one factor influences the economy of production of tobacco more then the fertilizer used." The soundness of this statement is proved in the following typical experiments—

G. A. Campbell of Hardin County, Ky., raised 600 lbs. of Burley tobacco per acre without fertilizer, 1,260 lbs. per acre when he used 1,000 lbs. of a 3-8-0 mixture, and 1,500 lbs. of tobacco per acre when he used 1,000 lbs. of a 3-8-10 mixture.

In Ware County, Ga., Fred Cribbs got only 160 lbs. of Bright Flue-cured per acre without fertilizer; 1,000 lbs. of 6-4-0 mixture brought his yield up to 480 lbs. per acre. And when he used 1,000 lbs. of a 6-4-10 mixture, he got his best yield of 890 lbs. per acre. *Thus, $6.00 worth of sulfate of potash increased his net income $76.00 per acre.*

And in Steuben County, N.Y., Mr. C. E. Bailey, raising wrapper tobacco, increased his net income $55.40 per acre by using $7.80 worth of sulfate of potash in 1,300 lbs. of a 4-6-10 mixture.

Sulfate of potash improves flavor and burning quality in tobacco; when needed to prevent sand drown on light sandy soils, specify sulfate of potash *magnesia.*

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"Government Inspected"

(*From page 7*)

markets by receivers, railroads and shippers, but it was seen that more effective work could be done by making inspections at shipping points. The Northwest apple shippers urged their Congressional representatives to provide such service so as to give them a better basis for making loss and damage claims in cross-country shipments, and the new service went into effect July 1, 1922.

The Federal Department of Agriculture was seriously handicapped at first because no appropriations had been provided for carrying on the new work. Each State was then asked to cooperate, the funds collected for inspections to pay the salaries of inspectors and other necessary expenses. Twenty-four States came into the service the first year, and supervisors were appointed by the Federal Department to train inspectors.

The inspectors are employed by the State and licensed by the Federal Department, inspections being made for shippers, dealers, railroads and other factors interested in specific transactions. A small charge is made for inspection, joint Federal-State certificates being issued attesting the quality and condition of the products.

THE number of inspections at shipping points, the first year, was over twice as many as had ever been inspected in terminal markets in one year. Of the 72,644 cars inspected, only 34 certificates were reversed on reinspection in the terminal markets. During the past year the number of certificates reversed averaged one in every 2,000 cars inspected.

Federal and State extension agencies for years have been extolling the advantages of standardization of farm products. According to F. G. Robb, Government official in charge of the Federal end of the service, "more progress can be made in securing the adoption of recognized standards at shipping point through inspection in a single season than can be accomplished in a number of years by any other means. Supervising inspectors have reported marked changes in grading practices in every section where shipping point inspection has been used."

Heavy inspections of peaches this year are expected to establish a new record for shipping point inspection.

Federal grades have been worked out for 38 fruits and vegetables, some or all of which are now in use in 36 States. Many States have established the Federal grades as State grades, thus providing for standardization on the same basis in both interstate and intrastate shipments. These grades have been arrived at by the most comprehensive study ever made of each product over its whole geographical range. The grades must fit the product actually grown and also reflect the elements which determine market value.

ANOTHER outstanding result of the new inspection service is the keeping of inferior products on the farms and shipping only the high quality products to market. This has effected economies in marketing. It has been well demonstrated that, especially in years of large crops, the low grade products frequently do not return the cost of transportation and handling and are a depressing influence on the price of the high grade products.

The organized cooperatives learned long ago that to increase consumption a standardized product of high quality must be placed on the market. Officials of the Department feel that similar results can be secured with fresh fruits and vegetables generally. A marked improvement in the quality of fresh fruits and vegetables on the market has been noted this year with consequently higher prices, and it is considered that a continuance of this policy will result in far-reaching benefits all along the line from producer to consumer.

The County Agent's Family

(*From page 5*)

wife taking an active part in community and church life, in taking an active interest in the work of her husband and in meeting with farmers' wives and attending meetings.

We have never envied the man and his wife who have no particular home. They may live in a "house" to be sure. They may get a light breakfast at the *house;* then go to the office or to the store for the morning. If there are children they are left at home with "grandma" or even in some cases to play alone and to fill in their time as best they may. At noon they may go to the restaurant; then back to the office, and so on. They may be making lots of money. But are they making a *Home?*

WE, as county agents, should all be willing to work hard, holding evening meetings twenty-five miles from home when occasion arises, help the man with cholera hogs on Sunday if necessary, and the like. But things like that don't happen every evening in the week nor every Sunday in the year. No executive board is going to expect their county agent to work twenty-one hours in a day throughout the year. There may be occasions, of course when such a thing is necessary, but that is far from normal.

We hold no brief against the county agent's wife who is the agent's office assistant or who is filling the place of a home demonstration agent or who may feel herself a widow; neither do we envy the bachelor county agent. But we do feel like pointing to an ideal that has not been suggested in any of the previous articles on this subject. That ideal is the county agent's *Family.*

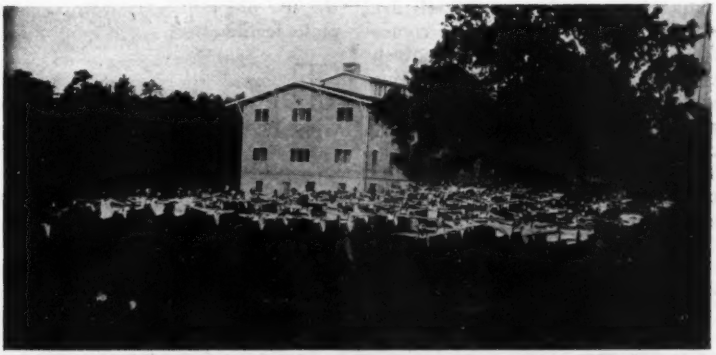
A New Field for the Agricultural College

(*From page 11*)

Most of the boys and girls were selected for the trip by their county agent, because they had won some honors in connection with their club work, and for these boys and girls all the expenses were paid. However, any other might come for the week by paying seven dollars, which covered all expenses—and this could be paid in staple articles of food.

Cooks and attendants were employed, and the county agents were in charge of the boys. The mornings were given over to study; the afternoons to swimming and games; and the nights to picture shows and entertainment. During the week an opportunity was given for the boys to inspect the college, including the nine hundred acres in the college farm and experimental plots. They met the instructors at the college, they got to know something of the nature of a college course in agriculture, and what is of greater importance they got a broad vision of their own possibilities.

In years to come, thousands of boys and girls will be entertained at this camp, and those who come will include the leaders of the future in agriculture and home economics at least for the State of Georgia. And many a boy from a poor farm will in later life be able to look back on his first trip to "Camp Wilkins" as the time when he was first fired with the ambition to make ample preparation for a life's work in some phase of the business of agriculture.



Setting-up exercises at Camp Williams every morning at 6.15, just after flag raising.

A New Wrinkle in Growing Alfalfa

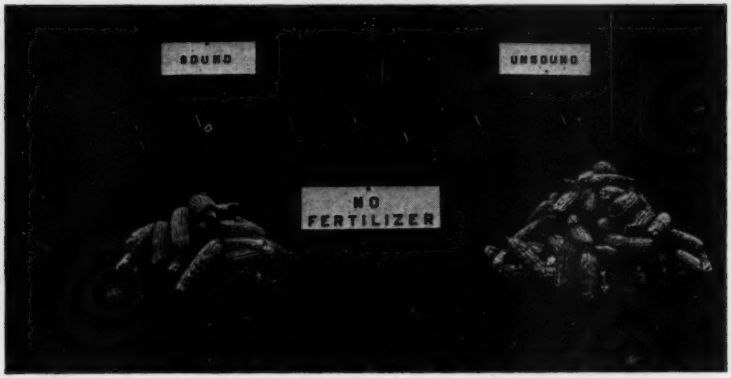
(*From page 14*)

part of October the alfalfa was knee high and excellent for pasturing although it was not pastured heavily as Mr. Moffit said he liked to have a heavy stand to protect it during the winter.

The Moffit boys raise pure bred Hereford cattle and this year sold a carload of bulls to a ranchman in Colorado. They feed out several carloads of hogs every year which they raise on the farm. They find a cross between the Tamworth and Duroc to be ideal for feeding and the type that tops the market. They say alfalfa is the ideal forage for the corn belt, both for pasture and hay.

Fertilizers for Quality and Profit

(From page 13)



Corn in rotation without any fertilizer treatment. Average annual yield for 8 years. 37.8 bushels per acre, 60.8 per cent of which was sound and 3,478 lbs. of fodder. Net returns $44.24 per acre. Delaware Experiment Station.

is a gain of $8.68 per acre where muriate of potash has been applied. Where two fertilizer materials are applied the greatest gain comes from the acid phosphate—potash combination. The gain in this instance is $23.25 per acre. When nitrate of soda is added to the above combination the gain is $29.29. This indicates that when nitrate is used in combination with the other elements it is profitable, but it is not profitable when used alone. The profits are about the same from the use of manure as from a complete fertilizer.

THE average farm value of the crops involved has been used as a basis of computing returns. No recognition has been taken of the fact that certain of the fertilizers applied produced better quality

TABLE I.

Average annual net returns per acre from various fertilizer and manurial treatments in a rotation of corn, soy beans, wheat and hay for eight years. (1916-23 inc.)

Treatments	Average Annual Net Returns Per Acre
None	$27.14
Nitrate of Soda	26.26
Acid Phosphate	31.47
Muriate of Potash	35.82
Nitrate of Soda, Acid Phosphate	34.04
Acid Phosphate, Muriate of Potash	50.39
Nitrate of Soda, Muriate of Potash	45.99
Nitrate of Soda, Acid Phosphate, Muriate of Potash	56.43
Basic Slag, Muriate of Potash	49.10
Rock Phosphate, Muriate of Potash	46.61
Manure	53.56

Corn in rotation, fertilizer 250 lbs. of acid phosphate and 75 lbs. of muriate of potash per acre. Average annual yield for 8 years. 69.4 bushels per acre, 86.9 per cent of which was sound and 5,437 lbs. of fodder. Net returns $73.42 per acre. Delaware Experiment Station.

grain than others. Table II. gives information as to quality of wheat, corn and soy beans produced from the various treatments. Muriate of potash produced the highest test weight per bushel on wheat, and the largest percentage of sound corn and mature soy beans of the single materials applied. The acid phosphate — potash combination was the best combination of two materials. The addition of the acid phosphate improved the quality of grain over that where potash alone was used. The addition of nitrate of soda to the acid phosphate - potash combination made some improvement in the quality but was not very marked.

The spread in variation in the quality of the wheat grown without fertilizer and with various fertilizer treatments is quite pronounced. The test weight per bushel of the wheat grown on the untreated plots ranged from 42 lbs. to 59 lbs. Wheat that tests 42 lbs. grades "sample," the lowest grade.

TABLE II.

Effect of fertilizers and manure upon the quality of wheat, corn and soy beans.

Treatments	Wheat Test wt. per Bushel	Percentage of Sound Corn	Percentage of Mature Soy Beans
None	51.6	60.8	96.1
Nitrate of Soda	52.5	64.9	95.7
Acid Phosphate	55.9	63.9	94.7
Muriate of Patash	56.7	73.2	99.6
Nitrate of Soda Acid Phosphate	55.1	65.4	95.3
Acid Phosphate Muriate of Potash	58.0	86.9	99.4
Nitrate of Soda Muriate of Potash	55.7	82.7	98.9
Nitrate of Soda Acid Phosphate Muriate of Potash	58.8	89.1	99.1
Basic Slag Muriate of Potash	57.6	84.8	99.7
Rock Phosphate Muriate of Potash	55.3	77.9	98.8
Manure	56.1	86.9	98.1

Wheat that tests 59 lbs. will grade No. 2, if it is otherwise clean. The test weight on the plots receiving acid phosphate and muriate of potash ranged from 54 lbs. to 60.5 lbs. Wheat testing 54 lbs. will grade No. 4 and wheat testing 60.5 lbs. will grade No. 1 if it is clean and bright. The test weight on the plots receiving nitrate of soda in addition to the acid phosphate and muriate of potash ranged from 57 lbs. to 61 lbs. Wheat testing 57 lbs. will grade No. 3 while wheat testing 61 lbs. will grade No. 1 if the samples are otherwise clean and bright.

The difference in price between the different grades of wheat is about three cents per bushel. That is to say that if No. 1 wheat is worth $1.25 per bushel, No. 2 will be $1.22; No. 3, $1.19; No. 4, $1.16; and No. 5, $1.13. Sample grade is the lowest grade and is worth only what it can be sold for as feed, and that depends upon the demand of the market. Perhaps it will be worth 60c. a bushel when No. 1 wheat is worth $1.25.

Applying these values to the results, the wheat testing 42 lbs. on the untreated plots will be worth 60c., the wheat testing 59 lbs. will be worth $1.22 per bushel a spread in possible value of 63c. or 103% on the unfertilized wheat. Wheat testing 54 lbs. will be worth $1.16 and wheat testing 60.5 lbs. will be worth $1.25 per bushel, a spread in possible value of 9c. or 8% on wheat receiving acid phosphate and muriate of potash. Wheat testing 57 lbs. will be worth $1.19 and wheat testing 61 lbs. will be worth $1.25, a spread in possible value of 6c. or 5% on wheat receiving nitrate of soda in addition to acid phosphate and muriate of potash. A similar lesson may be drawn from the corn and soy beans. However, it is sufficient to say that the efficient use of fertilizers produces a better quality of grain as well as a more uniform quality.

Something to Guard Against

(*From page 23*)

animals should be put on other feed as soon as signs of trouble are noted.

A TYPE of poisoning against which we would like to warn all extension workers to be on the lookout during sunny spring days is caused by young cocklebur sprouts. To illustrate, allow me to cite an experience along this line. Last Spring, Jesse Carlson, a farmer of Attica, Indiana, lost six young pigs in a mysterious manner. He brought the dead pigs to Purdue, located but a few miles away, and when they were posted cocklebur sprouts in the cotyledon or two-leaf stage were found in the stomachs. An examination of the pasture where the animals had been grazing revealed the presence of an abundance of cocklebur sprouts, many of which had been nipped. A quantity of the burs were collected and brought back to Purdue, where they were planted in a small enclosure and all other weeds were hoed out.

When the tiny sprouts began to show above-ground on our little cocklebur farm, an eighty-pound hog was put in the enclosure and deprived of other feed. Next morning the hog was dead, and a post mortem examination revealed the tell-tale sprouts in the stomach as well as other internal evidence of cocklebur poisoning. Another victim was placed in the enclosure and within twenty-four hours it keeled over and died. We believe cocklebur sprout poisoning is an important proposition where hogs are raised, particularly when overflow land or ground soaked by heavy spring rains begins to dry, for it is then that the sprouts appear in dangerous quantities.

Learn the truth about Fertilizer

Commercial fertilizer is not magic. It is no substitute for work, or for farming brains. It will not make a successful farmer out of a shiftless, ignorant failure. Fertilizer varies in quality like corn or tobacco or cotton, and some brands are worth more than others. Good fertilizers, like Royster's reliable old mixtures, are a godsend to good farmers who learn how to best use them to make money

Nearly forty years experience enters into the making of the Royster mixtures, and hundreds of thousands of the country's best farmers pin their faith to this famous old brand.

For advice about the use of fertilizer, write to Farm Service Department.

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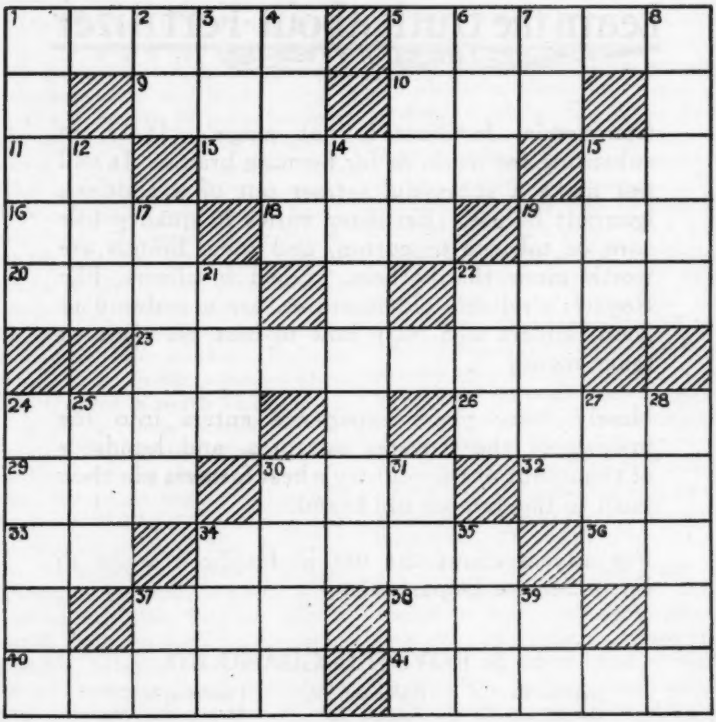
Field Tested Fertilizers

A Good Beginning

By S. L. Kahn

This is a good design and the definitions are accurate and, for the most part easy, though you may have to consult your dictionary for one or two.



HORIZONTAL

1. a decree.
5. title of rajah's wife.
9. auditory organ.
10. residue.
11. prefix meaning apart, away from.
13. rules, typical examples.
15. The capitol reserve (abbr.)
16. a vessel.
18. faucet.
19. hurry (poet.)
20. Paradise.
22. Xmas (old Eng).
23. kind of harp.
24. a model.
26. importunes.
29. rested.
30. a wind.

HORIZONTAL—*Continued*

32. Asian ox.
33. part of the verb to be.
34. a musical wind instrument.
36. Southern State (abbr.)
37. Friar's title.
38. Scotch headdress.
40. an edible gastropod mollusk.
41. a minute reproductive body.

VERTICAL

1. to follow.
2. that is (abbr.)
3. container.
4. horse's gait.
5. an inclined way.
6. equine quadruped.
7. New Eng. State (abbr.)
8. to outdo.
12. shrew mouse.
14. balustrade.
15. cease to exist.
17. left high and dry by tide.
19. sweet sirup.
21. born.
22. catch suddenly.
24. Emperors.
25. variety of sweet potatoes.
27. to choke with nausea.
28. denizen of the deep, a ray.
30. of the mouth.
31. takes nourishment.
34. a term in non - Euclidean Geometry.
35. short sleep.
37. note of scale.
39. Southern State (abbr.)

Are You a Cross Word Addict?

Some of our readers have submitted cross word puzzles to us for publication, so we are printing one of them this month to see how you like the idea.

If you want this department continued, write and tell me so. Better still, send me your solution of this month's puzzle by Feb. 22nd, and next month I will print the names of all who have solved it correctly together with the correct solution.

Designs for cross word puzzles will be welcome, especially on agricultural subjects. They should have not over one-sixth of the spaces black and as few unkeyed letters and abbreviations as possible. Puzzles accepted for publication will be paid for at the rate of $5 each. Try your hand at this and send me the results.

Jeff

Linked to the Past

(*From page 4*)

reduced and desirable traction increased.

Too late! We are linked to the past.

WHEN Henry Ford, Haynes, or whoever the world is willing to acclaim as the genius who first conceived the thought that a spring buggy could be made to navigate without disturbing Dobbins' peaceful slumber, when this genius took his secondhand carriage and installed an engine in it, he put it *under the seat.*

Of course, why not?

Later he moved it out in front, put a hood over it and the deed was done!

Every automobile since has copied the stunt. And you and I do not have to be engineers to see how foolish they all are—how hopelessly *they* are linked to the latter days of the 1890's.

The delicate radiator in front where it gets smashed every time two flivvers dispute the right of way. The motor as far from the rear axle as it can possibly be placed, unless it were hung out in front of the car, as Southern niggers hang corn before balky mules! The motor connected to the rear axle with a long drive shaft that makes owners swear and accessory dealers rich. The weight of the car handily placed in front where it hits the thank'-e-mam's first, and no weight on the back to lend traction and prevent skidding.

Of course, if you and I had never seen an automobile and were given a motor and chassis, we would put the motor *over* the rear axle, and parallel to it. The radiator we would probably incorporate as part of the top of our sedan—up where it is cool, and where it could not get smashed unless an eagle dropped a frozen herring on it. And we would sit in front where we could see the road clearly and inhale the refreshing breezes uncontaminated with gas fumes, and talk without competing with a laboring motor. But it would look odd now. People are accustomed to the present design. Too late.

I COULD go on indefinitely drawing this word-picture—this canvas which portrays how men, sheeplike, leap the fences because a forgotten leader picked the spot. But all around you are better examples than the ones I have given—examples of processes that are linked to the past—processes which are pregnant with opportunities for all of us.

Dare to severe the links of the past in a constructive way; cultivate the wisdom and grit to "try something new"—and you invite success to your door.

Are you linked to the past? Wait! Think a few moments. What progress have you definitely planned for tomorrow—next week—next year?

Sweet Clover

(*From page 9*)

its proper growth. Inoculating material can be secured from commercial sources or by taking three or four hundred pounds of dirt from fields growing alfalfa or sweet clover and scattering it over each acre. Sweet clover does best when planted on a firm seed bed with just sufficient dirt to cover the seed. Do not attempt to grow sweet clover on soil that is sour.

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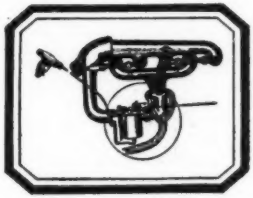

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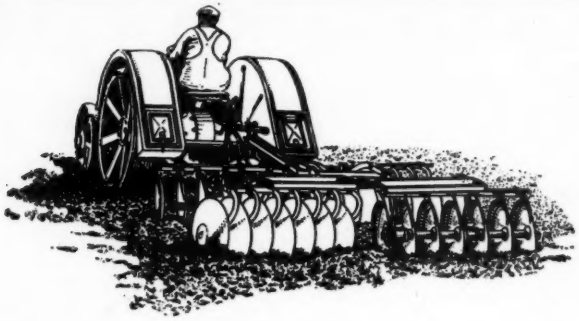

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